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PREFACE.

THE present work contains the Transactions of the Society of Arts for the Session 1834-35, being the Second and concluding Part of the 50th Volume. The Committee of Correspondence and Papers, the official editors of the Society's publications, subjoin a short statement of the contents of the entire volume, for the purpose of shewing to the Members at large, and to the other friends of the Institution, that the last two sessions have been actively employed, and that their contributions to the general stock of useful and practical knowledge are not unworthy of the place which the Society holds in the public regard.

In the class of Agriculture, Horticulture, and rural economy, Mr. Rogers' account of his large plantations of forest trees in his park at Stanage, continued through several successive years, contains not merely the required formal details, but several facts, both interesting and valuable, on the adaptation of different species of trees to different soils. Mr. Johnston's suggestion of the utility of charcoal for filling drains, will probably be found as advantageous in practice as it is new; and

Mr. Garth's method of freeing gooseberry-trees from caterpillars, comes recommended by its ascertained success. Mr. Cooper's letter, being a sequel to the statement in the preceding volume, respecting the effect of small allotments of land to agricultural labourers, contains many observations of deep interest in the present circumstances of the country. Mr. Burrows's experiment tends to shew, that on certain varieties of light land the practice of deep trenching with the spade insures a crop fully remunerative of its expense, and leaves the land in an admirable state for receiving a plantation of forest trees. Capt. Bagnold's letter communicates the full success of his method of conveying to England from Chili the seeds of that singular and splendid tree, the *Araucaria imbricata*, in a state of complete and healthy germination. Mr. Ward's notice respecting the success which has attended the importation of plants from foreign countries, by means of his almost air-tight glazed boxes, is of high importance, as avoiding the consumption of fresh water, which can scarcely be spared on long voyages, as well as those troublesome minutiae of management, which in general render the masters of ships so averse to take charge of a consignment of living plants.

In the class of Polite Arts, Mr. Parkyn's instrument for making a perspective drawing from a given plan, and Mr. Maclaurin's machine for stump

engraving, are distinguished for the accuracy of their construction ; and the plate, engraved entirely by means of the latter, shews that this has already been brought into actual use. Mr. Varley's graphic telescope and microscope, though not a recent invention, is now, for the first time, presented to the public in such a way as to make them acquainted with the optical arrangements of this valuable instrument, as well as with the details of its mechanical construction.

In the class of Chemistry will be found an interesting paper by Mr. Maugham, on his modification of Professor Daniell's blowpipe, for obtaining heat from the combustion of oxygen and hydrogen gases, by means of which scraps of platina may readily be melted into one mass. Mr. Roberts's ingenious method of dividing a pipe into capillary apertures, and Mr. Wilkinson's novel and expeditious plan for obtaining a ring of apertures, of extreme minuteness in bore, and of almost any required length, are very creditable to their respective inventors. Mr. Knight's paper on the effect of texture in disposing a bar of steel to receive magnetism, opens a new branch of inquiry, which, it is hoped, he will follow up.

Mr. Aylwin's paper on essential oil of spruce, makes the public acquainted with a new and excellent menstruum for the harder resins employed in the composition of varnishes, especially copal. The experiments made in Canada by that gentleman

have been fully confirmed by the practical skill of Mr. Neil, who has produced by means of it copal varnish of the very first quality. Mr. Varley, likewise, at the request of the Society, entered into an investigation, the satisfactory result of which adds another and no trivial obligation to those which have previously been received from this very zealous and disinterested member of our Society.

The attention of the class of Colonies and Trade has been almost exclusively directed to the West Indian colonies. The important change recently made in the circumstances of their negro population—a change honourable in the highest degree to the justice and humanity of the British legislature—seems to render it likely that a considerable share of manual labour will be withdrawn from the cultivation of the sugar-cane, and thus become applicable to other objects. With the view of directing the attention of the planter to some of these, the Society have published an interesting paper by Captain Colquhoun, on the Mexican method of drying the plantain, and thus bringing it into a state capable of entering into competition in the European market with the fig, the date, and other dried fruits. Another paper of considerable interest, on the fibre contained in the leaves of certain plants of the order *Bromeliaceæ*, natives of the West Indies and adjoining coasts of the American continent, has been

drawn up from information and samples sent to the Society by Dr. Hamilton, Mr. Vaughan, and Mr. Burge, Legislative Agent for the island of Jamaica. Mr. Johnstone, late of the island of Grenada, has communicated a paper on an insect that is devastating the cane-crops in that island, notwithstanding every attempt that has hitherto been made to prevent or limit its ravages.

In the class of Manufactures are three inventions, originating from practical mechanics and weavers in Spitalfields, applicable to the state of the silk manufacture as carried on in that district, and which it is believed will be found of general utility, namely, Mr. Hughes's warping jack, Mr. Roberts's addition to the Jacquard loom, and his frame for brocading. By means of the first, a warp is laid with less labour to the person employed, and with greater expedition, than by the use of the common warping frame. By means of the second, the numerous pattern cards required for the plain grounds of figured silks, by which the Jacquard machine is much incumbered, and which add considerably to the cost of the pattern, are reduced to a number sufficient for a single repetition alone; and are transferred to a small supplementary machine placed at the side of the common one. By means of the third, coloured patterns can be brocaded more expeditiously, with more variety, with a considerable saving of silk, and on a pure white ground.

The articles in the class of Mechanics are numerous, and may best be described by arranging them into groups.

Of the inventions relating to Ship-building and Navigation, there are Mr. Hookey's plan for strengthening the top-sides and decks of ships, by calling into use the lateral cohesion of the fibres of the timber, in order to resist the straining and warping of the whole fabric when exposed to the stroke of the waves;—Captain Lihou's improved rudder and stern-post;—Mr. Pearce's application of a break to the steering-wheel, whereby the rudder is brought more completely under command of the helmsman in heavy seas;—and Captain Pole's improvement on the scupper and hawse-buckler, as they are at present fitted on board ships of war. A carriage for moderating the recoil of pivot-guns, by the same officer, likewise deserves notice. Mr. Pope's traversing compass-box,—Mr. Gray's illuminator for a marine sextant,—and Mr. Pearce's signal-lantern for merchant-ships, are improvements in instruments for navigation; and Mr. Grant's very ingenious and effective machinery for making biscuits, will be found to have produced a reduction in the price, and a great improvement in the quality, of the principal article of food used on board ship.

Of improvements in philosophical instruments, the present volume contains a remontoire watch-escapement by M. Hanriot, Director of the *Ecole*

d'Horlogerie at Mâcon ;—Mr. Edwards's gage for shewing the direction and momentum of the wind ; —Mr. Brown's method of preserving an electrical machine in a state of activity even when immersed in a humid atmosphere ;—and Mr. Cuthbert's stand for short telescopes. Dr. Greene's very ingenious apparatus for grinding and polishing specula and lenses may likewise be arranged in this group, as well as Mr. Ross's method of preparing a polishing powder from oxide of iron, both sharper and more uniform in its quality than the colcothar now in use.

The contrivances for preventing serious and often fatal accidents, are, Mr. Laurie's spring-bar for a stirrup, by the use of which the foot of a person falling from his horse is immediately disengaged ; —Mr. Warner's stop for preventing the accidental discharge of fire-arms ;—and Captain Bagnold's puncturing forceps, to enable a surgeon to sew up a body after a *post mortem* examination, without the hazard of wounding his hand, and thereby inoculating it with a virus always productive of highly painful inflammation, and sometimes of death.

Among the more miscellaneous articles may be particularized Mr. Dodds's parallel motion for a steam-engine, which is placed so as to allow the piston to be withdrawn for repair, without dismounting the parallel motion itself, and also affords a simple means of obtaining a greater

number than usual of positions for pump-rods. Mr. Mackinnon's permutation lock, by allowing a change of position both in the tumblers and in the pieces composing the bit of the key, has offered the means of preventing a lock from being surreptitiously opened, even by its proper key. Mr. Franklin's tool for making tips to the stretchers of umbrellas, reflects no small credit on the ingenuity of the inventor, and also supplies very satisfactorily an acknowledged desideratum in this now extensive manufacture. Mr. Higgins's oblique candlestick both economizes the consumption of a very necessary article, and prevents the possibility of accidents happening from candles placed in passages and other situations where they are not under continual inspection.

The last class of papers that require notice in this cursory survey, are those relating to the microscope; an instrument of investigation that has of late years attracted a considerable share of the attention of the Society of Arts, and of which many improvements in the optical arrangement, as well as in those mechanical contrivances which give facility and precision to its use, will be found detailed in our Transactions, where likewise will be found several interesting examples of its successful application to researches in vegetable physiology. Those researches will be found to be continued and extended in the present volume by Mr. Varley. Mr. Goadby's adaptation of the microscope to the

accurate dissection of insects;—a notice by Mr. Bowerbank on the best method of preparing sections of wood for examination in the microscope;—and Mr. Powell's description of his minute adjustment, whereby an object on the stage of a microscope may be brought with ease into the precise focus of deep magnifiers, are all valuable in their respective departments, and will doubtless be duly estimated by those for whom this instrument possesses interest as a means of philosophic inquiry.

Three Illustrations by the Secretary, on the art of Tanning, on Timber, and on Ornamental Woods, are likewise inserted in the present volume.

To the pecuniary liberality of R. H. Solly, Esq., a liberality experienced on many former occasions,—to the pencil of Mr. Roze and of Mr. Ainger, Chairmen, the former of the Committee of Mechanics, and the latter of that of Correspondence and Papers,—as well as to Mr. Varley and Capt. Bagnold, the Society are indebted for the drawings from which many of the engravings on wood and copper in the first part, and all of those in this second part have been copied; and Mr. Maclaurin has presented the steel plate engraved by means of the instrument of which that plate contains a representation.

Three presents made to the Society, appear to the Committee to deserve a more special notice than simply the insertion of them in the *List of*

Presents. The first of these is an interesting series of twenty specimens of hone-stones and grindstones, with a short description of the same sent by Mr. Knight of Foster Lane. The next is a collection of between four and five hundred specimens of Indian woods from Capt. Baker. And the third, a collection of beautiful models of the new Dutch weights and measures, presented by M. Adam von Toorn of the Hague.

While noticing the liberality of individual members of the Society in diminishing the expense of publishing the Transactions, and thus rendering the funds of the Society available for the other demands on it, the Committee cannot pass by the present opportunity of recording that the usual periodical repairs of the Society's premises have likewise been effected by the same means; and that Mr. Brockedon, one of the Chairmen of the Committee of Polite Arts, has given his personal assistance and superintendence in re-stretching and varnishing one of the series of pictures by the late Mr. Barry, which adorn the room in which the Society hold their meetings.

The Society during the last session has had the pleasure of offering to its Secretary an acknowledgment of his long and eminent services. A subscription was entered into by a few of the most active members, and very liberally seconded by all to whom an opportunity of doing so was given.

The proceeds were devoted to the purchase of a microscope, which should embrace the recent improvements, including those which have been given to the public in the latter volumes of the Society's Transactions. Its construction was intrusted to Mr. Ross, who has amply realized the intentions of the subscribers, and has produced an instrument which, for power, variety, convenience, and, it may be added, for magnificence, is probably unrivalled. Satisfied, however, as the subscribers have reason to be in this respect, they feel that they have still done imperfect justice to the worth and talents of Mr. Aikin, and to the obligations they have endeavoured to record in the following inscription, which is placed on the case of the microscope :—

Presented
BY THE MEMBERS OF THE SOCIETY FOR THE ENCOURAGEMENT OF
ARTS, MANUFACTURES, AND COMMERCE,
TO
ARTHUR AIKIN, Esq., SECRETARY,
IN TESTIMONY OF THEIR HIGH RESPECT FOR HIS CHARACTER,
AND OF THEIR GRATITUDE FOR THE ZEAL AND ABILITY
WITH WHICH HE HAS ADVANCED THE OBJECTS AND
PROMOTED THE INTERESTS OF THE SOCIETY.
MDCCCXXXV.

The presentation took place after the evening Illustration on the 12th day of May, 1835, when an appropriate address was delivered by Dr. Roget, one of the Vice-presidents.